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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/731,989

12/09/2003

Jeffrey Brian Sampsell

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03/24/2005

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EXAMINER

CHOI, WILLIAM C

ART UNIT

PAPER NUMBER

2873

DATE MAILED: 03/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/731,989

Applicant(s)

SAMPSELL ET AL.

Examiner

William C. Choi

Art Unit

2873

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 23 December 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) 27-31 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-13 is/are allowed.
- 6) ☒ Claim(s) 14, 17, 19-22 and 24-26 is/are rejected.
- 7) ☒ Claim(s) 15, 16, 18 and 23 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 1203.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Election/Restrictions***

Applicant's election without traverse of Group I (claims 1-26) in the reply filed on 12/23/2004 is acknowledged.

### ***Information Disclosure Statement***

Receipt of the Information Disclosure Statement (IDS) with copies of the references cited therein, was received on 12/9/2003. An initialized copy of the IDS is enclosed with this office action.

### ***Claim Objections***

Claim 14 is objected to because of the following informalities: in line 6, "is" should be deleted so that the claim reads, "electrical connection is forms".

Claim 17 (and dependent claims 18 and 19) is objected to because of the following informalities: the claim should end with a period, "." in line 6. Claims 18 and 19 inherit the objection from their parent claim.

Claim 18 is objected to because of the following informalities: in line 2, "comprises" should be changed to "comprising". Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 21 and 24 (and dependent claims 25 and 26) are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Specifically in claim 21, applicant discloses wherein sub-elements are fractions of sizes (i.e. "half-size, quarter-size"), but fails to disclose what the fraction is in comparison to, thereby rendering the claim vague and indefinite. For purposes of examination, in agreement with claim 24, it was assumed that the comparative measure was to a "display element" (i.e. "half-size of a **display element**").

Specifically in line 3 of claim 24, applicant discloses said method comprising forming "sub-elements", each having a size approximately equal to one half a display element and further discloses in line 5, forming "sub-elements" having a size approximately equal to half the size of "a next largest element". The first issue concerns the disclosure of multiple "sub-elements" in said display equal to half the display element. The presence of merely 2 sub-elements would not allow for the presence of any additional sub-elements of "half the size of a next largest element" as claimed. Additionally, applicant does not distinguish between the "sub-elements" of different sizes, making it unclear if the invention is claiming their formation in the alternative, thereby rendering the claim vague and indefinite.

For purposes of examination, from interpretation gathered from the disclosure, the claim language assumed was: "forming a sub-element... of a size... one half a display" (line 3) and "forming **additional** sub-elements... each **additional**... half the size of the next largest" (line 5). Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 14, 17, 19, 20, 22, 24 and 25 are rejected under 35 U.S.C. 102(e) as being anticipated by Miles et al (U.S. 6,680,792 B2).

In regard to claim 14, Miles et al discloses a light modulator, comprising: an array of interferometric display elements arranged in rows and columns (column 13, lines 26-34 and column 18, line 60 – column 19, line 5, Figures 18A, B, and 29A-C), each element comprising a predetermined number of sub-elements (column 13, lines 29-31, Figure 18B, "1803"), wherein the number of sub-elements is determined by a desired bit depth (column 11, lines 34-42) and each element is approximately the same size (Figure 18B); electrical connections between the sub-elements such that the electrical connection is forms a sub-element cascade (column 13, lines 27-34, Figure 18B); and

an array connection line corresponding to each row of display elements (Figure 18A), wherein each array connection line is electrically connected to a sub-element in each display element (Figure 18B, "1810").

In regard to claim 17, Miles et al discloses a method of manufacturing a light modulator, the method comprising: providing an array of interferometric display elements arranged in rows and columns (column 13, lines 26-34 and column 18, line 60 – column 19, line 5, Figures 18A, B, and 29A-C), each element comprising at least one sub-element cascade of a predetermined number of sub-elements (column 13, lines 29-31, Figure 18B, "1803"); and electrically connecting a first element in each sub-element cascade in a row to a corresponding connection line for that row (column 13, lines 27-34, Figure 18B).

Regarding claim 19, Miles et al discloses wherein the method further comprises electrically connecting the connection lines for each row to a driver device (column 12, lines 28-67, Figures 14-16).

In regard to claim 20, Miles et al discloses a light modulator, comprising: an array of interferometric elements (column 10, lines 37-55, Figure 7A, "700, 702, 704", sub-pixel); each element comprising a pre-determined number of sub-elements, each of a different size corresponding to a different binary weight of display information (column 10, lines 39-42, wherein the number of sub-elements depends upon a desired bit depth (column 11, lines 34-42).

Regarding claim 22, Miles et al discloses a connection line for each sub-element (column 13, lines 31-34, Figure 18A, "1808, 1810").

In regard to claim 24, Miles et al discloses a method of manufacturing a light modulator, the method comprising: providing an array of interferometric display elements (column 10, lines 37-55, Figure 7A, "700, 702, 704", sub-pixel); forming a sub-element within each display element of a size approximately equal to one half a display element (column 10, lines 42 and 51-52, Figure 7A, "718", re: Imod sub-array); forming additional sub-elements as desired, each additional sub-element having a size approximately equal to half the size of a next largest element (column 10, lines 40-42, Figure 7A, "706, 708, 710").

Regarding claim 25, Miles et al discloses the method comprising forming a connection line for each sub-element (column 13, lines 31-34, Figure 18A, "1808, 1810").

### ***Allowable Subject Matter***

Claims 1-13 are allowed.

The following is a statement of reasons for the indication of allowable subject matter: The prior art fails to teach a combination of all the claimed features as presented in claims 1-7: a light modulator comprising an array comprised of rows and columns of interferometric display elements, each divided into sub-rows of sub-elements as claimed, specifically comprising sub-array connection lines electrically connected to each array connection line, and switches to transmit the operating signals from each array connection line to the sub-rows to effect gray scale modulation.

The prior art fails to teach a combination of all the claimed features as presented in claims 8-13: a method of manufacturing an interferometric light modulator comprising providing an array of interferometric display elements arranged in rows and columns as claimed, specifically wherein each element comprises a predetermined number of sub-rows depending upon a desired bit-depth for a display and a predetermined number of sub-columns corresponding to a desired number of colors for the display.

Claim 18 would be allowable if rewritten to overcome the objection set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

The prior art fails to teach a combination of all the claimed features as presented in claim 18: a method of manufacturing a light modulator comprising providing an array of interferometric display elements arranged in rows and columns as claimed, specifically comprising providing an array of interferometric elements having at least one sub-element cascade further comprising providing a sub-element cascade for each desired color.

Claims 21 and 26 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The prior art fails to teach a combination of all the claimed features as presented in claim 21: a light modulator comprising an array of interferometric elements, each comprising a pre-determined number of sub-elements as claimed, specifically



comprising four sub-elements, first, second, third and fourth sub-elements correspondingly a half, quarter, eighth and sixteenth size of a display element.

The prior art fails to teach a combination of all the claimed features as presented in claim 26: a method of manufacturing a light modulator comprising providing an array of interferometric display elements as claimed, specifically comprising forming a connection line for each display element and providing multiplexing switches in electrical connection between the connection line and the sub-elements.

Claims 15, 16 and 23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The prior art fails to teach a combination of all the claimed features as presented in claim 15: a light modulator comprising an array of interferometric display elements arranged in rows and columns comprising sub-elements as claimed, specifically comprising a predetermined number of sub-element cascades within each display element, wherein the predetermined number is a desired number of colors.

The prior art fails to teach a combination of all the claimed features as presented in claim 16: a light modulator comprising an array of interferometric display elements arranged in rows and columns comprising sub-elements as claimed, specifically comprising addressing circuitry to provide an addressing pulse to each sub-element cascade, wherein a number of sub-elements in the cascade that become active depends upon a length of the addressing pulse.

The prior art fails to teach a combination of all the claimed features as presented in claim 23: a light modulator comprising an array of interferometric elements, each comprising a pre-determined number of sub-elements as claimed, specifically comprising a set of switches electrically connected between the display element and the sub-elements, such that sub-elements needed to create a weighting of a pixel are activated in accordance with display information.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William C. Choi whose telephone number is (571) 272-2324. The examiner can normally be reached on Monday-Friday from about 9:00 am to 6 pm.

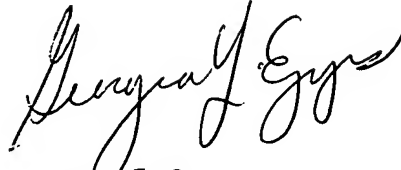
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Y. Epps can be reached on (571) 272-2328. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should

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you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

W.C.  
William Choi  
Patent Examiner  
Art Unit 2873  
March 14, 2005

  
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